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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

ED 065640

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

SNIPPER BELT SORTER 8-04.10

B-574 S-294

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EDUCATION & WELFARE
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U. S. Employment Service in
Cooperation with
Oregon State Employment Service

February 1964

GATB # 2487

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

SNIPPER BELT SORTER 8-04.10

B- 574

Summary

The General Aptitude Test Battery, B-1002A, was administered to a final sample of 53 female applicants who were later employed as Snipper Belt Sorters 8-04.10 at the Stayton Canning Company, Stayton, Oregon. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data and their combined selective efficiency, Aptitudes P-Form Perception, K-Motor Coordination and F-Finger Dexterity were selected for inclusion in the final test norms.

GATB Norms for Snipper Belt Sorter 8-04.10, B-574

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
P	CB-1- A CB-1- L	85	P	Part 5 Part 7	85
T	CB-1- G CB-1- K	80	K	Part 8	85
F	CB-1- O CB-1- P	100	F	Part 11 Part 12	95

Effectiveness of Norms

The data in Table IV indicate that only 68 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 81 percent would have been good workers. 32 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 19 percent would have been poor workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Snipper Belt Sorter 8-04.10.

II. Sample

During the period of May 28, 1963, through August 15, 1963, the GATB B-1002A was administered to a sample of 186 women applicants for work as Laborer at the Stayton Canning Co., Stayton, Oregon. Of those hired, 59 were employed as Snipper Belt Sorters with the remainder being placed on other jobs.

Three of the sorters were dropped from the sample because they were on this job a short time and the supervisors did not observe enough of their work to rate them. Three more were eliminated because it was decided to retain only those who had worked at least two shifts. The plant management believes an entry worker should be able to learn to do a satisfactory job in this length of time. The final sample consists of 53 women.

Test results were not used in selection of applicants, and no other tests are used by the employers. Experience is not required, and there is no minimum educational requirements. Women, exclusively, are hired for this occupation with a preference for high school and college-age girls because of their adaptability to working conditions. On the job training is given.

TABLE I

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

N = 53	M	σ	Range	r
Age (years)	23.1	9.9	16-57	-.127
Education (years)	11.5	1.1	7-14	.428**
Experience (days)	12.8	7.8	2-37	.275*

*Significant at the .05 level
**Significant at the .01 level

III. Job Description

Job Title: Snipper Belt Sorter (can. & preserv.) 8-04.10

Job Summary: Inspects green beans as they pass on traveling belt. Picks out cull beans and extraneous material and drops them on belt which runs to waste area. Picks out beans with unsnipped ends and drops them on belt which returns them to snippers.

Work Performed: Stands at traveling belt and inspects green beans as they pass on belt. Picks up cull beans and extraneous material with fingers. Drops culls and other material onto belt which runs to waste area. Spreads piles of beans on belt so that each bean can be inspected. Picks out beans with untrimmed ends, drops them onto belt which returns them to snippers.

IV. Experimental Battery

All the tests of the GATB, B-1002A, were administered to the sample group.

V. Criterion

The criterion data collected consisted of two sets of independent ratings made by the first-line supervisor on USES Form SP-21, "Descriptive Rating Scale." A period of three weeks elapsed between the first and second ratings. The rating scale consisted of nine items covering different aspects of job performance, with five alternatives for each item. Weights of one through five, indicating the degree of job proficiency attained, were assigned to the alternatives. Due to the shortness of the canning season, second ratings were obtained on only 41 of the 53 employees in the final sample. On the basis of two sets of ratings for 41 women, a reliability coefficient of .819 was obtained for the criterion. The first ratings for all 53 individuals were used as the final criterion. These ratings had a distribution of 5-24, with a mean of 16.6 and a standard deviation of 4.5.

VI Qualitative and Quantitative Analyses

A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Form Perception (P) - required to inspect beans to determine the cull beans, foreign materials, and beans that need to be returned to the snippers.

Motor Coordination (K) - required to identify and reach rapidly for culls and foreign material that are to be removed from the belt.

Finger Dexterity (F) - required to pick up rapidly the cull beans and foreign material with the fingers.

On the basis of the job analysis data, Aptitudes V-Verbal Aptitude and N-Numerical Aptitude were rated "irrelevant" for successfully performing the duties of this job.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 53

Aptitudes	M	σ	r
G-Intelligence	110.7	18.7	.232
V-Verbal Aptitude	108.4	19.0	.158
N-Numerical Aptitude	103.3	15.7	.200
S-Spatial Aptitude	110.2	21.2	.168
P-Form Perception	110.8	19.5	.226
Q-Clerical Perception	108.2	14.1	.130
K-Motor Coordination	114.0	16.6	.271*
F-Finger Dexterity	107.5	21.1	.347*
M-Manual Dexterity	109.5	20.3	.278*

*Significant at the .05 level

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important					X		X	X	
Irrelevant		X	X						
Relatively High Mean	X			X	X		X		
Relatively Low Sigma						X			
Significant Correlation with Criterion							X	X	X
Aptitudes to be Considered for Trial Norms					P		K	F	M

Trial norms consisting of various combinations of Aptitudes P, K, F and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of P-85, K-85 and F-95 had the best selective efficiency.

VII. Validity of Norms

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 32 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between test norms consisting of Aptitudes P, K and F with critical scores of 85, 85 and 95 respectively, and the dichotomized criterion for Snipper Belt Sorter 8-04.10. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Validity of Test Norms for Snipper Belt Sorter 8-04.10
(P-85, K-85, F-95)

N = 53	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	7	29	36
Poor Workers	10	7	17
Total	17	36	53

Phi Coefficient = .39
χ^2 = 8.227
P/2 < .005

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes P, K and F with minimum scores of 85, 85 and 95, respectively, have been established as B-1002 norms for Snipper Belt Sorter. The equivalent B-1001 norms consist of P-85, T-80, F-100.

IX. Determination of Occupational Aptitude Pattern

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 35 OAP's included in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.